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| 10/517,602      | 07/08/2005  | Wouter Van Praag     | VANP3003/JEK        | 6667             |

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| EXAMINER |
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COMLEY, ALEXANDER BRYANT

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12/14/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |  |   |  |
|------------------------------|--|---|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/517,602   | <b>Applicant(s)</b><br>VAN PRAAG ET AL. |  |
|                              | <b>Examiner</b><br>Alexander B. Comley | <b>Art Unit</b><br>4156                 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 7/8/2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belgium Patent Coppens (BE 1,012,655) in view of United States Patent Persson (3,367,562) and in further view of UK Patent Application Publication Ott (GB 2,133,585).

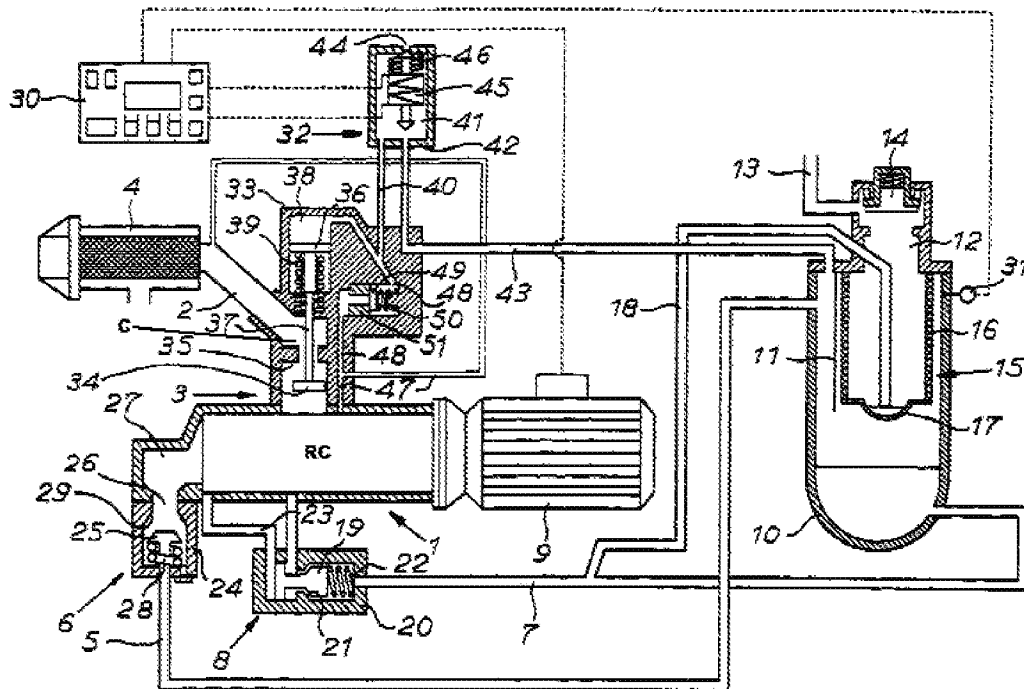


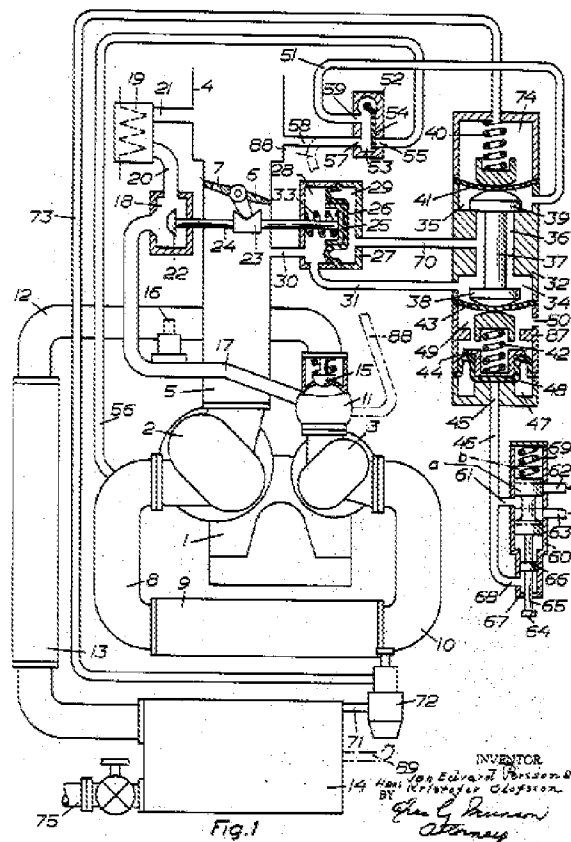
Figure 1

4. Independent **Claim 1** is rejected under 35 U.S.C. 103(a) as being unpatentable over Belgium Patent Coppens (BE 1,012,655) in view of United States Patent Persson (3,367,562) and in further view of UK Patent Application Publication Ott (GB 2,133,585). In reference to Figure 1 shown immediately above, Belgium Patent Coppens (BE 1,012,655) directed to an Air Compressor Using a Motor-Driven Screw Compressor discloses:

Compressor containing a compressor element (1) comprising a rotor chamber (RC) connected to an inlet pipe (2) and an outlet pipe (5); a reservoir (10) in communication with the outlet pipe (5); a pressure regulating system including an inlet valve (3) associated with the inlet pipe (2); a piston (37) connected to the inlet valve (3) and which is movable in a cylinder (38); wherein the piston (37) is a double-acting piston which divides the cylinder (38) into two closed cylinder

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chambers (38, C). However, Coppens (BE 1,012,655) fails to disclose applicant's chamber-specific piping setup, non-return valve, or bridge bridging the inlet valve.



As shown immediately above in Figure 1, United State Patent Persson (3,367,562) directed to a Means for Unloading and Controlling Compressor Units discloses:

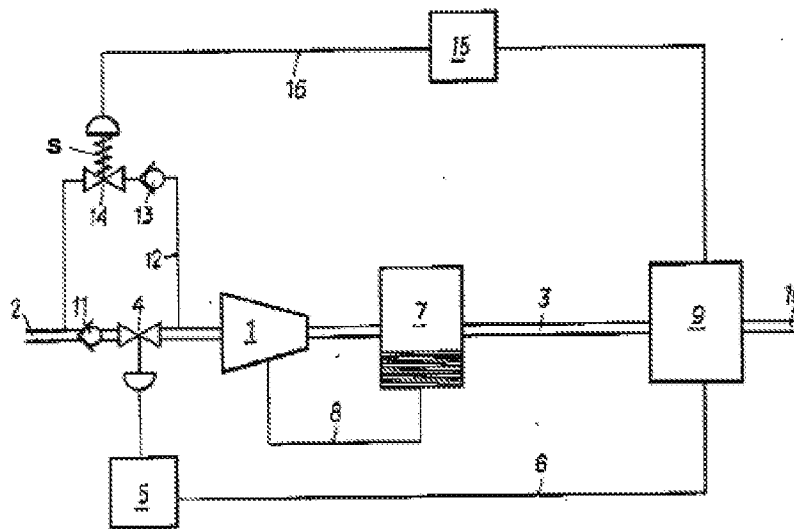
The cylinder chamber (35), on a side facing away from the inlet valve (6), is connected to a part of the rotor chamber (2) located near the inlet valve via a pipe (70); and on the other side of the piston (37), the cylinder chamber (36) is

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connected to a part of the rotor chamber (2) situated near the inlet valve (6) and to the non-return valve (6) via a pipe (31)

However, although the Persson document discloses applicant's chamber-specific piping setup, it fails to disclose applicant's bridge bridging the inlet valve.

FIG. 1



As seen in Figure 1 immediately above, UK Patent Application Publication Ott (GB 2,133,585) teaches the final aspects of Independent Claim 1 by disclosing a bridge bridging the inlet valve, a gas stream limiter, and a gas pipe. In particular, Ott discloses:

A bridge (12) bridging said inlet valve (4) and in which, between the inlet pipe (2) and the rotor chamber (1), are successively mounted a gas stream limiter (11) and a non-return valve (13) which only admits gas into the rotor chamber (1); a gas pipe (16) connecting the reservoir (9) to the part of the bridge (12) situated between the gas stream limiter (11) and the non-return valve (13); and a relief valve (14) associated with said gas pipe (16).

Each of the above prior art references deals with controlling the capacity and/or flow of the lubricant (or gas) within a compressor control system. Consequently, one of ordinary skill in the art desiring more precise compressor control could have easily modified the piston of Coppens with the double-acting piston setup disclosed by Persson, as well as the bridge setup found in Ott, in order to obtain this increased control. Consequently, it would have been obvious to one of ordinary skill in the art of compressor capacity controls at the time of the invention to modify the conduit setup of Coppens with the specially designed double-acting piston and bridge setups of Persson & Ott in order to obtain predictable results; those results being a more accurate compressor control system that provides reliable control of the inlet valve.

5. Dependent **Claims 2, 4, 5, and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Belgium Patent Coppens (BE 1,012,655) in view of United States Patent Persson (3,367,562) and in further view of UK Patent Application Publication Ott (GB 2,133,585). In reference to the previous figures shown above, the prior art references substantially disclose:

(2) Compressor according to Claim 1, wherein the pipe (Persson; 70) connecting the cylinder chamber (Persson; 35) on the side which is turned away from the inlet valve (Persson; 6) to a part of the rotor chamber (Persson; 2) situated near the inlet valve (Persson; 6) as such forms the connection between the piston (Persson; 37) and the inlet valve (Persson; 6).

(4) Compressor according to Claim 1, wherein the relief valve (Ott; 14) comprises a pneumatic valve which is equipped with a spring (Ott; S) and which is connected by a pipe (Ott; 16) which is directly connected to the reservoir (Ott; 9) and a control line (Ott; 16) which is also connected to said reservoir (Ott; 9) via a control valve (Ott; 15)

(5) Compressor according to Claim 4, wherein the control valve is an electromagnetic valve (32).

(6) Compressor according to Claim 1, wherein the inlet valve (Coppens; 3) includes a housing (Coppens; 33) forming a common housing with the cylinder (Coppens; 38)

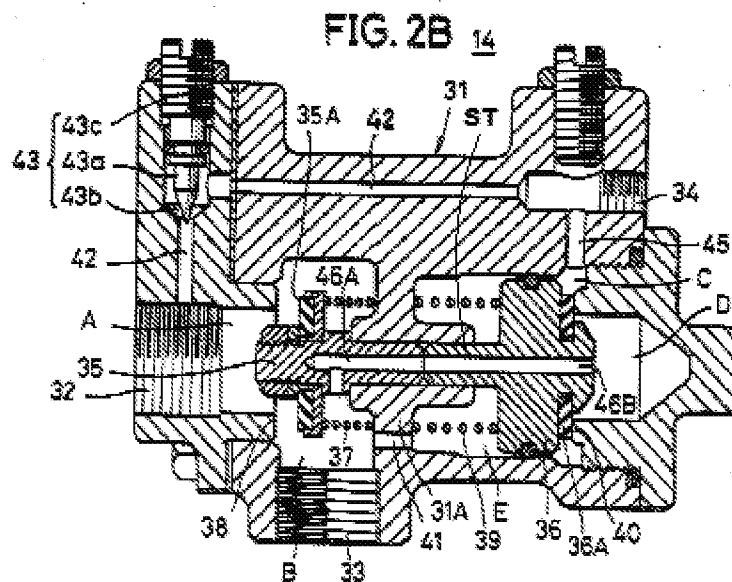
As shown in Figure 1 above, the Persson portion of the combination clearly shows a pipe 70 specifically forming the connection between the compressor and the chamber facing away from the inlet. In particular, Persson discloses "Since the auxiliary valve member 37 is in upper position, the inter cooler pressure also enters intermediate space 36, pipe 70, and second chamber 29 in the cylinder 27 in which inter cooler pressure acts to keep the valve control rod in open throttle position and 35 the valve 22 in closed position against the spring 33 and the rising pressure in 17 and in spite of the fact that vacuum in the intake conduit 5 is replaced by atmospheric pressure as soon as the throttle valve 6 opens fully." (Column 4, Lines 30-38) In Figure 1 of the Ott portion of the combination, a relief valve 14 is clearly shown equipped with a spring S (Also See Figure 2 & 3 of Ott). Furthermore, Ott discloses a control line 16 connected to both the reservoir 9 and the control valve 15. Finally, the Coppens portion of the combination



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shows both an electromagnetic solenoid control valve 32, as well as a housing 33 of the cylinder 38 being formed into a common housing with the inlet valve 3.

It would have been obvious to one of skill in the art to utilize the known techniques disclosed in the prior art in order to improve a similar compressor control system in the same way. One of ordinary skill in the art at the time of the invention could have easily applied the known improvement techniques of Persson's connection pipe, Ott's relieve valve, and Coppens' electromagnetic control valve & housing in order to obtain predictable results; those results being a more reliably and efficiently controlled valve-and-pipe compressor control system.



5. Dependent **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over the Coppens-Persson-Ott combination, as stated above, and further in view of Tsuchida (4,406,589). In reference to Figure 2B immediately above, the Tsuchida portion of the combination discloses:

(3) Compressor according to Claim 2, wherein the connection between the piston and the inlet valve comprises a stem (ST) provided with a duct (46A, 46B) extending over its entire length.

As shown in Figure 2B above, Tsuchida discloses a valve assembly comprising a duct provided throughout the length of the piston stem. In particular, Tsuchida discloses, "Relief passages 46A and 46B are respectively formed in the check valve 35 and the main valve 36, along the axial direction thereof." (Column 5, Lines 5-7) One of ordinary skill in the art of compressors could have easily utilized the stem duct of Tsuchida using similar methods to obtain similar and predictable results. Therefore, it would have been obvious to one of ordinary skill in the art of compressor capacity controls to modify the piston setup of the Coppens-Persson-Ott combination with the stem-and-duct setup disclosed by Tsuchida in order to obtain predictable results; those results being a simplified connection between the piston and the inlet valve.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following selected patents and technical literature is cited to further show the state of the art in vacuum-generating unit and related technology in general where the not all obvious salient features of the patents are disclosed as follows:

- US Patent 4,708,599 to a Rotary Compressor Apparatus discloses a rotary compressor unit and suction valve that utilizes negative pressure (no spring) to open and/or close the valve.
- US Patent 5,318,151 to a Method and Apparatus for Regulating a Compressor Lubrication System discloses a lubrication system comprised of a reservoir, controller, and bypass conduit in order to effective control the flow of oil through the compressor.
- US Patent 4,388,046 directed to Rotary Compressors discloses a rotary oil sealed compressor that utilizes dual-acting pistons in unloader valves

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance." Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER COMLEY whose telephone number is 571-270-3772. The examiner can normally be reached on MONDAY-FRIDAY 9:00-3:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID J. ISABELLA can be reached on 571-272-4749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC  
11/21/07

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Patent Examiner

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Primary Examiner, Art Unit 3725